

New records and species of biting insects from the Ethiopian region. II.

by

BOTHA DE MEILLON,

The South African Institute for Medical Research, Johannesburg.

The types of the new species described below are in the collections of the South African Institute for Medical Research, Johannesburg. I am greatly indebted to Mr. J. Muspratt, and Miss L. O'C. Black for help during the course of the preparation of this paper.

CULICIDAE.

BELGIAN CONGO.

Culex telesilla De Meillon & Lavoipierre (1945) (Fig. 1 a, b, c, d, e).

The description of the larva of this species (De Meillon et al, Bull. ent. Res., 36, 91, 1945) was quoted from a manuscript by De Meillon and Lavoipierre. Mention of this was unfortunately omitted.

♂. *Head*: decumbent scales narrow, white; upright scales all black; a ring of white scales round the eyes. Palps all dark, hairy. Proboscis reaching to the middle of the penultimate palpal segment. *Thorax*: mesonotum very sparsely clothed with narrow light brown scales, on the prescutellar area these scales white; *apn* dark and bare of scales; pleurae on the whole paler than scutum, mesepimeron with a patch of about ten flat white scales, lower mesepimeron somewhat darkened and with a single bristle; upper sternopleuron with a patch of about fifteen flat white scales, lower with eight similar scales. *Wings*: all dark, upper fork cell about twice as long as its stem. *Legs*: mainly dark without any sign of tarsal or tibial banding or pale markings; fore and mid femora pale posteriorly up to their apices, anteriorly all dark; hind femur pale anteriorly almost to the apex leaving a narrow dark band which is about as long as wide, dorsally about the apical half dark. *Abdomen*: tergites almost completely dark, VI, VII and VIII with a few basal pale scales laterally at the extreme edge of each segment; sternites difficult to see in all specimens but VII and VIII largely pale scaled. *Terminalia*: sternite IX somewhat enlarged though not so much as in *perfidiosus* Edws., tergite of two narrow strips each carrying a number of small hairs; paraprocts with short basal arms as in *perfuscus* Edws.; side pieces with a prominent row of bristles ventrally, lobe prominent carrying a long arm on which

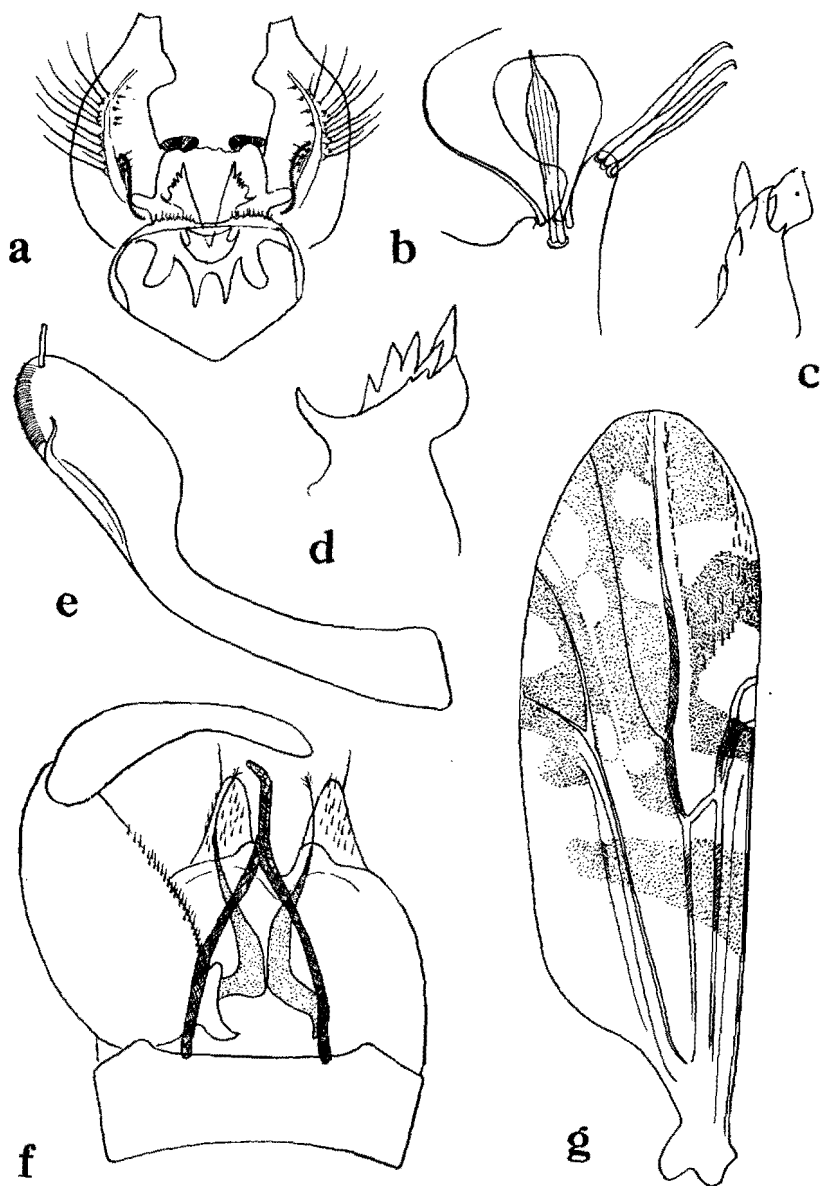


Fig. 1. *Culex telesilla* De M. & Lavp.: a. ♂ terminalia in ventral view; b. lobe of the sidepiece; c. one side of the phallosome in ventral view; d. phallosome in side view; e. clasper. *Culicoides acastus* sp. nov. f. ♂ terminalia in ventral view; g. ♂ wing.

setae *a*, *b* and *c* are mounted, leaf very broad, flattened apically, almost square and mounted on a small pedicel, *f* broad, expanded towards the apex, sharply pointed, *h* in the form of a long sinuous hair; clasper expanded apically and evenly rounded at the apex with a prominent flange on one side; phallosome with inner division represented by a small tubercle.

♀. As in the ♂ but upper fork cell four times as long as its stem; sternites largely pale scaled; basal pale spots of the tergites prominent but not visible dorsally.

Described from 4 ♂♂ and 1 ♀, Yangambi, Belgian Congo (Dr. M. Parent), and several specimens from Tete, Portuguese East Africa (De Meillon and Pereira).

The adult closely resembles *perfuscus* Edws. and the only external difference in the ♀ appears to be that the upper fork cell is much longer. When dealing with this species Edwards (Mos. Ethiop. Reg. III, 340, 1941) noted under variation that females from Bas Lomani, Belgian Congo and Aburi, Gold Coast, have the upper fork cell markedly longer. It is quite possible that he had *telesilla*, before him and not *perfuscus*. The male terminalia differs from that of *perfuscus* principally in the shape of the clasper which is more expanded and rounded apically and in having seta *h* sinuous, seta *f* broader and expanded apically and the leaf more rounded ventrally. The arrangement of the teeth of the outer division of the phallosome is also slightly different.

In an account dealing with mosquitos from Mocambique (Documentario Trimestral, No. 27, p. 74, Sept. 1941) De Meillon and Rebelo recorded *perfuscus* from Tete but remarked that although the terminalia resembled *perfuscus* the larva was like that of *perfidiosus*. A re-examination of this material shows that these specimens are referable to *telesilla*.

BECHUANALAND.

Little is known about the fauna of this territory. Edwards (Mos. Ethiop. Reg. III, 1941) lists only eleven species. During the early months of 1946 the writer had occasion to visit Ngamiland on yellow fever investigations. A number of species hitherto unrecorded from the territory were collected and these plus some collected by the South African Railways and Harbours are given below.

Anopheles funestus Giles. Kasane, Maun, Gomare, Mahembo. Adults were present in large numbers in Native huts. This is probably a common species everywhere near or in swamps.

Anopheles coustani var. *ziemanni* Grün. Kasane, Mahembo, Shakawe. Adults were taken biting man in a lighted room at 8.30 p.m. also in thick bush between 3 and 5 p.m. in clear weather. They were also taken in a Magoon trap using a monkey as bait in the

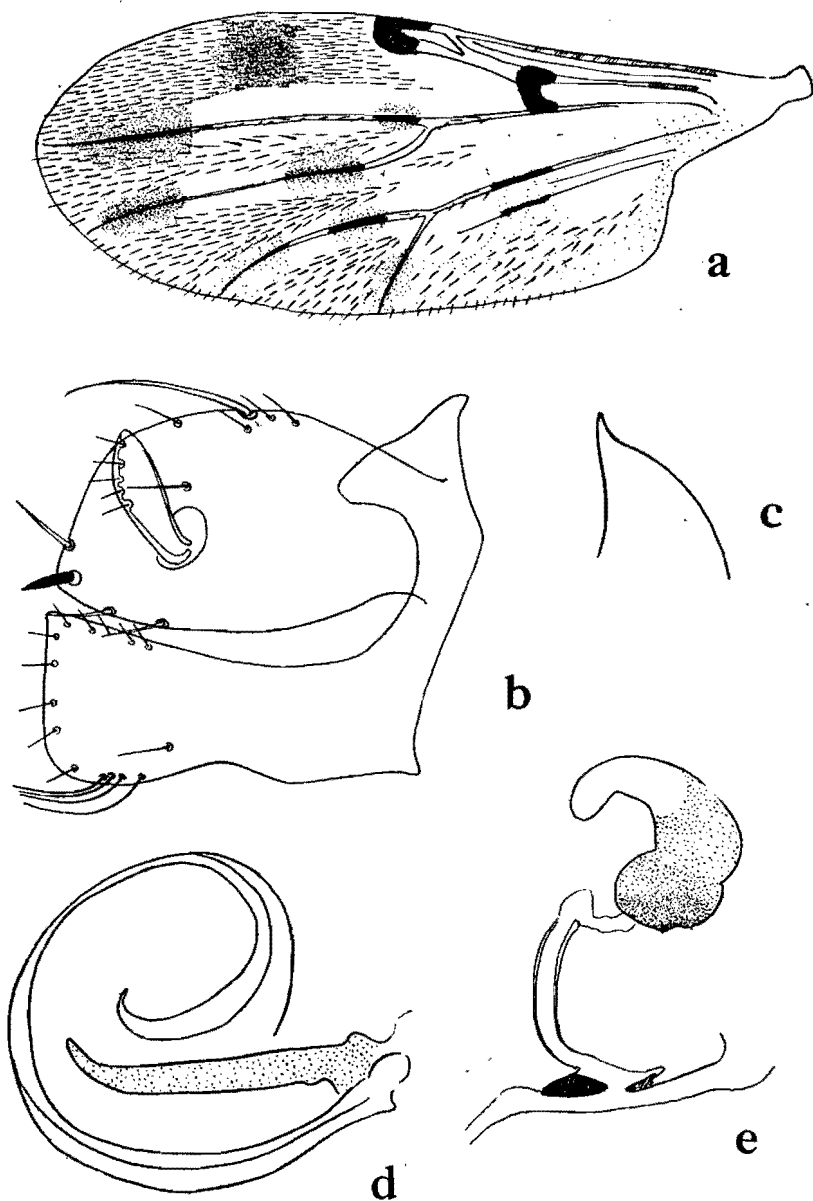


Fig. 2. *Alluaudomyia transvaalensis* sp. nov. a. ♀ wing. *Chiastopsylla capensis* sp. nov. b. ♂ clasper and sternite IX. *Xenopsylla pasiphae* sp. nov. c. paramere; d. internal plate and coil; e. spermatheca and pigmented sclerite.

evening and early morning. Many adults had fresh blood in them and there is no doubt that they feed readily on monkeys.

Anopheles coustani ssp. *caliginosus* De Meillon. Kasane. This species was hitherto only known from Jadotville, Belgian Congo. At Kasane adults entered a lighted room in the evening.

Anopheles rufipes Gough. Oudiauqui. Adults taken on the window of a lighted room in the evening.

Anopheles pretoriensis Theo. Mahalapye, Tsessebe. (Coll. S.A.R. & H.).

Anopheles pharoensis Theo. Kasane. Adults taken in a lighted room in the evening.

Anopheles marshalli Theo. Francistown, Tsessebe. (Coll. S.A.R. & H.).

Anopheles rhodesiensis Theo. Lobatsi. (Coll. S.A.R. & H.).

Anopheles demeilloni Evans. Francistown, Lobatsi. (Coll. S.A.R. & H.).

Anopheles cinerens Theo. Lobatsi. (Coll. S.A.R. & H.).

Anopheles nili Theo. Mahembo. Adults captured on the gauze of a lighted room in the evening.

Anopheles distinctus N. & C. Kasane, Maun, Mahembo, Shaka-we. This is undoubtedly one of the commonest anophelines near the swamps. Adults were taken in a lighted room and in a Magoon trap with a Native as bait in the evening and biting in thick bush in the afternoon in clear weather. This anopheline is usually regarded as exophilic and zoophilic, but there is little doubt that it will bite man readily out of doors.

Aedes (Stegomyia) aegypti L. Kasane, Nata. At the time of my visit this mosquito was rare. At Kasane a few adults were captured on a Native in thick forest and at Nata a few larvae were discovered in a disused petrol drum.

Aedes (Stegomyia) metallicus Edws. Kasane, Nata, Maun, Francistown. These records are all of larvae, no adults were taken biting.

Aedes (Stegomyia) luteocephalus Newst. Kasane, Maun. At Kasane common in the forest where it bit man readily on the forest floor, and also on a 50 foot high platform. At this latter level it was the only mosquito found attacking man. A specimen was also taken while feeding on a recently killed baboon. The insect appeared to experience no difficulty with the baboon's thick fur through which it crept much in the manner of a hippoboscids. No adults were taken in a Magoon trap when baited with a monkey either on the forest floor or on the 50 foot platform.

Aedes (Stegomyia) simpsoni Theo. Kasane. Very rare at the time of my visit. A few larvae only in plant axils.

Aedes (Stegomyia) vittatus Bigot. Kasane. Larvae from rock pools. As elsewhere in South Africa adults did not come to bite man.

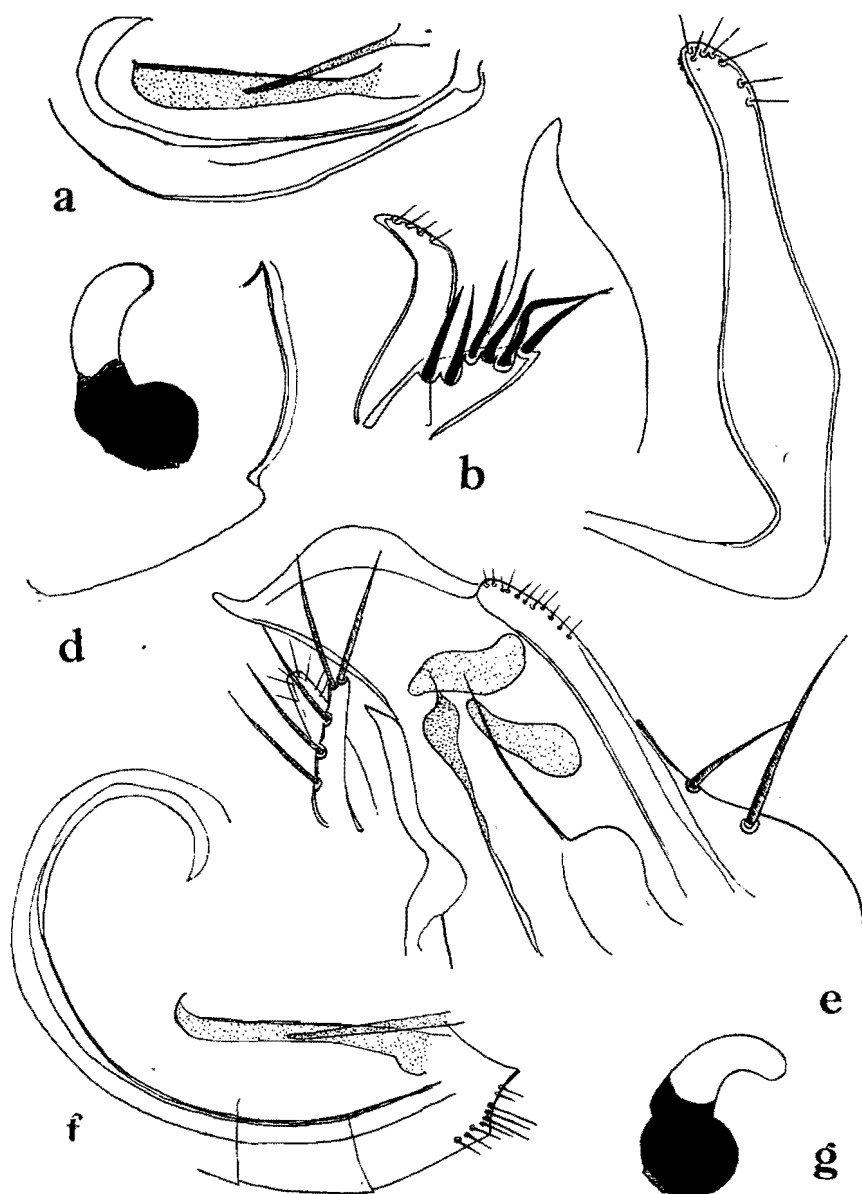


Fig. 3. *Xenopsylla achilla* sp. nov. a. internal plate and coil; b. processes of the clasper and paramere; c. sternite IX; d. spermatheca. *Xenopsylla mulleri* sp. nov. e. apex of the abdomen; f. internal plate and coil; g. spermatheca.

Aedes (Stegomyia) amalthaeus de Meillon. Kasane. A few adults taken biting a Native on the forest floor. Previously only known from Livingstone, N. Rhodesia.

Aedes (Diceromyia) fasciipalpis Edws. Kasane. Larvae.

Aedes (Banksinella) circumluteolus Theo. Kasane. A common mosquito in forest and bush near swamps. Comparatively large numbers were taken biting man in the afternoon.

Aedes (Aedimorphus) fowleri d' Emm. Kasane. Larvae.

Aedes (Aedimorphus) marshalli Theo. Larvae.

Aedes (Aedimorphus) argenteopunctatus Theo. Very rare at the time of my visit. One adult taken biting a Native in thick forest.

Aedes (Finlaya) fulgens Edws. Kasane. One adult taken on a Native on the forest floor.

Culex (Culiciomyia) nebulosus Theo. Kasane, Nata.

Culex fatigans W. Palapye, Francistown (S.A.R. & H.).

Culex univittatus Theo. Kasane, Nokanen, Mahembo, Shakawe, Nata, Maun. A persistent biter in all these places, occasionally troublesome in late afternoon. Also taken in a Magoon trap baited with a monkey.

Culex theileri Theo. Lobatsi, Palapye. (S.A.R. & H.).

Culex poicilipes Theo. Mahembo, Maun. On one occasion adults were taken in a Magoon trap baited with a monkey.

Culex simpsoni Theo. Kasane.

Culex antennatus Beck. Kasane, Mahembo, Maun. This was the only culicine found in Native huts. It was also caught biting in the evening and afternoon in forest.

Culex argenteopunctatus Theo. Nata.

Culex (Lutzia) tigripes Gpr. & C. Francistown. (S.A.R. & H.).

Ficalbia mediolineata Theo. Kasane. Adult caught in a lighted room in evening.

MADAGASCAR.

Anopheles mascarensis sp. nov.

A small species, wing length 2.4 mm. closely resembling *marshalli* Theo. for which it was at first mistaken (De Meillon, J. Ent. Soc. S. Afr., 6, 91, 1943). It differs from this species in the following respects:

♀. *Palp*: segments 2 and 3 narrowly pale apically, 4 and 5 completely pale or 4 with a few dark scales medially. *Pharynx*: with a single row of 10 — 12 closely set teeth of two kinds, outer ones with long tapering filaments and moderately broad bases, median two or three teeth much shorter with fimbriated apices; crests in posterior view evenly rounded; post-pharyngeal ridges apparently bare but well marked. *Wings*: smaller than in *marshalli* and dark areas on the costa more reduced especially towards the apex.

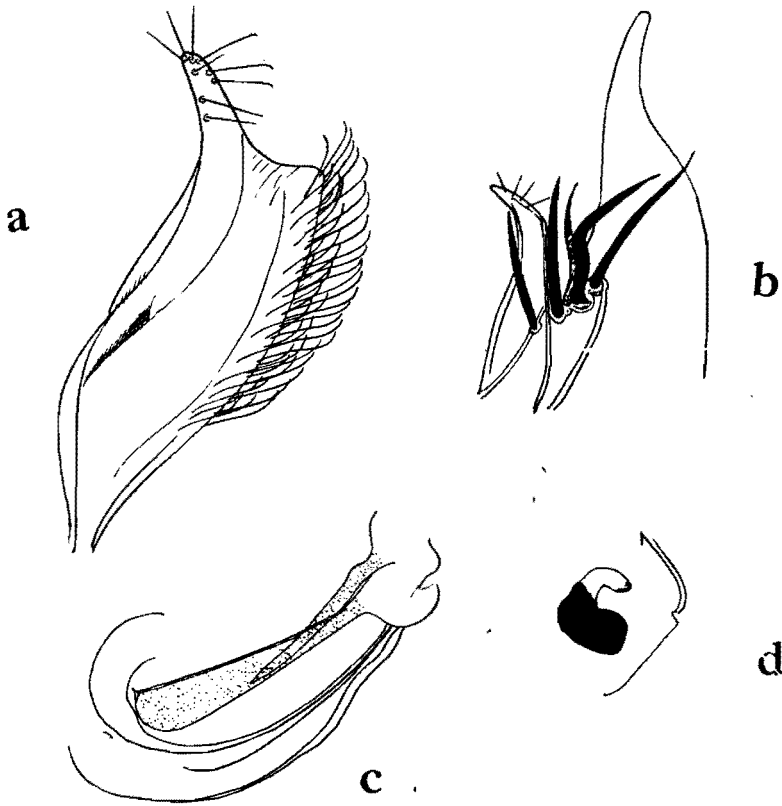


Fig. 4. *Xenopsylla bechuanae* sp. nov. a. sternite IX; b. processes of the clasper and paramere; c. internal plate and coil; d. spermatheca.

♂. *Palp*: as in *marshalli*. *Terminalia*: as in *marshalli* but innermost parabasal spine mounted on a marked prominence; apical bristle of the harpago much longer than the club; outer accessory as long as or longer than the club and a long inner accessory present; phallosome leaflets eight in number, apical two or three serrated on one side, the longest measuring 40 μ . Type ♀, 4 other ♀♀ and 2 ♂♂ from Diego Suarez area, Madagascar. (Coll. Lt. B. Young). All reared from larvae but latter not available for description.

According to the pharynx this insect is a *Neomyzomyia* and is easily separable from other members of that group. *neireti* of Blanchard (1906) may possibly be an older name for it. Taking external characters only into consideration the extensive pale scaling of the palps may be sufficient to distinguish it from other Mala-

gasy species. It is of interest to note that this is the second *Neomyzomyia* — generally agreed to be a very ancient group — which is peculiar to Madagascar.

CERATOPOGONIDAE.

Culicoides acastus sp. nov. (Fig. 1, f, g).

♂. Wings with well defined pale spots, verticils markedly yellow. *Head*: mouth parts dark brown; eyes widely separated, bare; frontal lobes large, much as in *cornutus* De M. *Palps*: the relative lengths of the segments are II 10, III 17, IV 7, V 10; III very slightly swollen medianally at site of sensory pit. *Antennae*: the relative lengths and greatest widths of the segments are:

	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
L	25	12	12	12	12	12	11	11	10	16	29	31	33
W	10	10	7	7	6	6	5	5	5	5	5	5	5

Verticils strikingly yellow; III with a long stalk; IV — XI poorly pigmented, rest brown. *Thorax*: mainly dark brown without any defined pale areas; scutellum dark brown with two central and one marginal bristle on each side; halteres brown with paler crowns. *Wing*: length measured from the arculus 1.4 mm., greatest width 0.5 mm.; length of costa 0.84 mm.; macrotrichia scanty and confined to the apex of the wing, none extending further back than the end of the costa; anal and cubital cells bare; distal half dark with prominent pale spots, proximal half largely pale; the most conspicuous dark spots are: one near the apex of the costa involving the radius but not the distal cell and the other just beyond the end of the costa. *Legs*: femora dark brown; tibiae of fore and mid legs dark brown but narrowly pale basally; hind tibia narrowly pale apically as well as basally. *Abdomen*: dark brown throughout. *Terminalia*: sternite IX not markedly excavated, the membrane bare; tergite IX broad, not narrowing apically, cleft medianally on the apical margin, no apical lateral processes; sidepieces with numerous short pointed spines internally; aedeagus with apical portion drawn out to a marked degree, extreme apex rounded; parameres gradually narrowed to fine hairy points. *Type* ♂ and another ♂ taken at light, Mooiplaats, Transvaal, 18.4.44 (R. du Toit).

This species is related to *vitshumbiensis* Goetgh. described from a ♀ but mesonotum without four black longitudinal lines and wings with some macrotrichia. Very much like *grahami* Austen, the wing pattern practically identical, but much larger, the terminalia also similar but aedeagus more drawn out apically and sidepieces with numerous short spines internally. *hirtius* De M. has sidepieces similarly armed but the tergite possesses apical processes and the aedeagus is not so prolonged apically.

Alluaudomyia transvaalensis sp. nov. (Fig. 2 a).

♀. A conspicuously ornamented species with white abdomen, spotted thorax and dark markings on the wings. *Head*: mouth parts dark brown, eyes widely separated, bare. *Palps*: the relative lengths of the segments are: II 10, III 10, IV 9, V 14; none swollen or enlarged; a small sensory pit on III. *Antennae*: the relative lengths and greatest widths of the segments are:

	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
L	15	10	10	10	10	10	11	11	14	15	15	15	15
W	7	5	5	4	4	4	4	4	4	4	5	5	5

Thorax: dark brown with grey areas which are conspicuously marked with dark brown spots; scutellum yellowish with a brown mark medially; halteres waxy white. *Wing*: greatest length measured from the arculus 1.4 mm., greatest width 0.64 mm., costa 0.7 mm.; macrotrichia dense apically and in the anal cell, scanty between the costa and the cubitus but extending back as far as the cross vein; two well marked dark spots, one enveloping the end of the costa, the other over the cross vein; in addition a rather faint brown spot just beyond the costa; other infuscations mainly confined to the veins as follows: a long one at the apex of M1, M2 and the base of M2, at the base of M1 a smaller somewhat rounded spot, two long ones on Cu 2 one on Cu 1, one on the stem of Cu and one on the anal vein; rest of the wing whitish. *Legs*: femora dark brown, each with a narrow subapical white band; tibiae brown, each with a narrow sub-basal pale band except on the hind tibia where the white band is greatly enlarged in addition hind tibia with a broad apical pale band; tarsi whitish except t1 of hind leg which is dark brown; claws of all legs large, unequal. *Abdomen*: completely dull white dorsally, dark brown ventrally. Type ♀, taken at light, Onderstepoort, Transvaal. 16.9.43 (R. du Toit).

This species comes near *maculosa* De M. but differs in having an additional brown spot, on the membrane beyond the costa and having the brown spots on the veins elongated and diffuse instead of well and sharply defined.

SIPHONAPTERA.**Xenopsylla pasiphæ** sp. nov. (Fig. 2 c, d, e).

A species belonging to the *piriei-eridos* group and very similar to *piriei* Ingram.

♂. *Head*: palp slightly shorter than the proboscis which extends to the apex of the fore coxa, the relative lengths of the palpal segments are: I 15, II 16, III 14, IV 22; dorsal incassation shallow as in *piriei*. *Thorax*: no bristle behind or above the stigma of the metepisternum which bears eight bristles on each side. *Legs*: fore

tarsal segment V with three ventral spiniform bristles; hind tibia with six posterior notches including the apical notch; longest bristle at the apex of hind tarsal segment II reaches nearly to the apex of segment V. *Abdomen*: antepydigial bristle submarginal; bristles on the tergites and sternites, counting both sides together, as follows:

	I	II	III	IV	V	VI	VII
Tergite	12	15	14	14	14	13	12
Sternite	—	2	4	4	6	6	6

Sternite VIII with six marginal and six lateral bristles on each side; last bristle of sternite VIII nearer to the apex than to the preceding bristle. *Terminalia*: as in *piriei* Ingram but coil of the penis shorter and the paramere with the apical projection more pointed.

♀. Generally as in *piriei* except for a slight difference in the size of the spermatheca. *Head*: palp shorter than the proboscis the latter reaching to the apex of the fore coxa. Relative lengths of the palpal segments are: I 16, II 20, III 14, IV 25. *Thorax*: metepimeron with twenty-one bristles on the two sides together. *Legs*: hind tibia as in the male. *Abdomen*: bristles on the tergites and sternites as follows:

	I	II	III	IV	V	VI	VII
Tergite	12	16	14	15	14	13	12
Sternite	—	2	6	6	6	6	6

Tergite VIII with bristles on the two sides as follows: marginal 9 — 10, sub-marginal 9 — 10, lateral 6 — 8. *Spermatheca*: with the base of the tail at its widest only slightly narrower than the head; dorsal wall of the oviduct with a pigmented sclerite.

Identification and variation.

This species resembles *piriei* Ingram very closely. The males may be distinguished as follows: (1) coil of the penis shorter not making a complete second turn. In fifty specimens the coil averaged 102.5 units with minima and maxima of 75 and 117 units whereas in fifty *piriei* from various localities these measurements were 142.6 and 130 — 162. There is no overlap and the males can always be recognized by this character. The measurements were made by first drawing the coil with the aid of a camera lucida and then stepping it off with the aid of a pair of calipers. (2) paramere with the distal edge more sloping and the apical projection more pointed. (3) on the average the sternites carry less setae. In twenty ♂♂ the number of setae, counting both sides together, varied between the following minima and maxima: III 4 — 6, IV 6 — 7, V 6 — 8, VI 6 — 8, VII 6 — 8, giving an average of 27. On sternite VIII counting the setae of one side only these figures are 11 — 16 giving an average of 12. In twenty ♂♂ of *piriei* from various localities the

minimum and maximum figures are the same for sternites III — VII but the average is 35. Sternite VIII in these same males gave minimum and maximum figures of 17 — 22 with an average of 18.

The females are less easily distinguishable. The spermatheca of seventy specimens of the new species and of seventy *piriei* were measured in various ways and it was found that the width of the base of the tail at its widest point serves to distinguish between them. In the new species the average width is 15.1 units and in *piriei* 12.4 units. A frequency of distribution curve shows that there is no overlapping of these measurements. In addition the pigmented sclerite at the base of the bursa is larger in *piriei*.

This species was collected in the same area at the same time with *piriei* but it is worthy of note that though *piriei* occurred on *Tatera afra* (Gray), *Parotomys brantsi* (Smith) and *Desmodillus auricularis* (Smith) the new species was not found on the latter.

Type ♂ from *Tatera afra* (Smith), 37 miles north of Het Kruis, Clanwilliam District, Cape Province, 12.1.43 (C. V. Muller). A long series of ♂♂ and ♀♀ off the same host and off *Parotomys brantsi* (Smith) from the following localities: Commonage, Steytlerville; 27 miles on Colesberg-Hanover road; Merriman, 28 miles on Hanover-Richmond road; Gamka River; 10 miles on Prince Albert road; 42 miles on Prince Albert-Laingsburg road; 34 miles on Murraysburg-Beaufort West road; Doornbosch, 79 miles on Calvinia-Clanwilliam road; Karingmelkvlei, Graafwater; Kariega River, Richmond-Murraysburg road.

***Xenopsylla mulleri* sp. nov.** (Fig. 3 e, f, g).

A species belonging to the *niloticus* subgroup.

♂. *Head*: eye developed; maxillary palp slightly longer than the proboscis but does not reach to the apex of the fore coxa; occipital groove at its deepest slightly less than the width of the eye. *Thorax*: one bristle behind the stigma of the metepisternum. *Legs*: fore tarsal segment V with three ventral spiniform bristles; hind tibia with six dorsal notches bearing stout bristles, the 5th notch close to the apical notch with a wide space between the 4th and 5th notches and between the 2nd and 3rd notches, the 3rd and 4th notches are close together. *Abdomen*: bristles on the tergites and sternites, counting both sides together, as follows:

	I	II	III	IV	V	VI	VII	VIII
Tergite	8	19	20	18	17	17	14	—
Sternite	—	2	6	6	8	8	8	over 30

Antepygidial bristle marginal; sternite VIII with a marked concavity just before the apex on the posterior margin. *Modified segments*; sternite IX of almost even width throughout, posterior and anterior margin chitinized up to near the apex. P1 of the clasper

about as long as P2, narrow and straight sided but slightly narrower apically, with long stout bristles on the anterior margin and one or two at the apex; ejaculatory duct with a large hump near the apex anteriorly, a pigmented sclerite on each side near the apex of the duct; paramere broad with the anterior apical margin produced into a short rounded process, dorsal margin slightly sloping, rounded posteriorly; internal plate turned up and sharply pointed; coil not making one complete turn.

♀. *Head*: maxillary palps slightly longer than the proboscis but not reaching the apex of the fore coxa. *Thorax*: one bristle behind the stigma of the metepisternum. *Abdomen*: bristles on the tergites and sternites, counting both sides together, as follows:

	I	II	III	IV	V	VI	VII	VIII
Tergites	8	19	18	16	16	16	13	40-50
Sternites	—	2	9	10	10	11	10	

Spermatheca: head rounded and much broader than base of tail and with the pigment confined to the extreme base of tail.

Type ♂, five other ♂♂ and eighteen ♀♀ of *Tatera lobengulae*, Kuruman, C.P. (C. V. Muller), three ♂♂, twelve ♀♀ off the same host, Danielskuil, Kimberley, C.P. (C. V. Muller) two ♂♂, one ♀ off the same host, Kalabo, Barotseland, N. Rhodesia and one ♂, one ♀ off *Otomys irroratus* from the same locality (Dr. J. H. C. Clarke).

This species is closely related to *niloticus* J. & R. It differs in the ♂ principally in the shape of the paramere; sternite VIII concave posteriorly. The ♀ has less bristles on the tergites and sternites of the abdomen and the head of the spermatheca is more rounded than in *niloticus* J. & R.

***Xenopsylla achilla* sp. nov. (Fig. 3 a, b, c, d).**

A species belonging to the *brasiliensis* subgroup.

♂. *Head*: eye developed; maxillary palps shorter than the proboscis which appears to reach the apex of the fore coxa; occipital groove at its deepest exceeds the width of the eye. *Thorax*: no bristles behind or above the stigma of the metepisternum. *Legs*: fore tarsal segment V with three ventral spiniform bristles; hind tibia with seven dorsal notches bearing stout bristles, the apical notch included. *Abdomen*: antepygial bristle marginal; bristles on tergites and sternites, counting both sides together, as follows:

	I	II	III	IV	V	VI	VII	VIII
Tergites	7	16	16	16	15	14	11	
Sternites	—	2	11	8	8	8	9	± 30

The apical marginal bristles of sternite VIII are long and curved and placed close together; apical bristle further from apex of the sternite than from the preceding bristle. *Modified segments*:

sternite IX slightly swollen basally and narrowing towards the apex, apical half more or less of even width; P1 of clasper shorter than P2 bearing stout bristles one of which is elbowed; P2 curved apically, apex pointed; ejaculatory duct with a large hump on the posterior margin near the apex; paramere pointed apically with the anterior margin more or less straight and posterior margin convex basally and slightly concave near apex; internal plate narrow at the base, dorsal margin straight, ventral slightly convex; coil not making one complete turn.

♀. Maxillary palps shorter than the proboscis which reaches nearly to the apex of the trochanter of the fore leg. *Legs*: hind tibia as in male. *Abdomen*: bristles on the tergites and sternites, counting both sides together, as follows:

	I	II	III	IV	V	VI	VII	VIII
Tergites	6	17	16	16	14	14	10	±50
Sternites	—	2	12	11	10	10	13	

Spermatheca: head broader than base of tail; pigment confined to the base of the tail which is not much wider than the apex.

Type ♂ and three ♀♀ from Angonia, Portuguese East Africa. Host unknown. (Coll. Dr. Liz Ferreira).

This species resembles *crinita* somewhat, differing in the shape of the internal plate which widens more abruptly from the base; in the relative shallowness of the occipital groove and in the VIIIth sternite of the male not bearing a closely packed brush of long bristles. In the ♀ the spermatheca differs slightly as illustrated.

***Xenopsylla bechuanae* sp. nov. (Fig. 4 a, b, c, d).**

A species belonging to the *brasiliensis* subgroup.

♂. *Head*: eye well developed; maxillary palps slightly shorter than the proboscis which reaches nearly to the apex of the fore coxa; occipital groove, at its deepest, about equal to the width of the eye. *Thorax*: no bristles behind or above the stigma of the metepisternum. *Legs*: fore tarsal segment V with three ventral spiniform bristles; hind tibia with seven dorsal notches bearing stout bristles, the apical notch included. *Abdomen*: antepygidial bristle marginal, bristles on tergites and sternites, counting both sides together, as follows:

	I	II	III	IV	V	VI	VII
Tergites	8	19	19	18	18	16	13
Sternites	—	2	9	10	10	10	14

Sternite VIII has over 50 bristles, lateral and marginal, counting both sides together; the last marginal bristle is situated further from the apex of the sternite than from the preceding bristle. *Modified segments*: sternite IX narrowed apically with a few delicate hairs at the apex, bearing posteriorly a large membranous

lobe densely clothed with fine, long hairs; P1 of the clasper shorter than P2 and bearing stout elbowed bristles; P2 pointed and turned up at the apex; apex of the ejaculatory duct with a small dorsal and ventral hump near the apex; paramere broad basally narrowing rapidly to form the dorsal apical process which is long and slightly curved; internal plate club-shaped, coil not making a complete turn; manubrium of the clasper three quarters of the length of the internal plate.

♀. *Head*: palps shorter than the proboscis which reaches to the apex of the fore coxa. *Abdomen*: the number of bristles on the segments, counting both sides together, are as follows:

	I	II	III	IV	V	VI	VII
Tergites	8	18	20	20	18	16	15
Sternites	—	2	12	12	12	11	28

Tergite VIII with about 60 bristles on the two sides together. *Spermatheca*: head broader than base of tail more or less flattened ventrally; base of tail with a ventral hump and pigment more or less confined to the swollen base.

Type ♂ off *Saccostomys campestris*, Sebena, thirty miles on Francistown-Nata road, Bechuanaland Protectorate, nine ♂♂ and eight ♀♀ from the same locality and host, one ♂ and two ♀♀ from Moane, Bechuanaland off the same host. (Coll. D. H. S. Davis).

***Chiastopsylla capensis* sp. nov. (Fig. 2 b).**

Somewhat intermediate between *pitchfordi* Ing. and *mulleri* Ing. The male clasper resembles that of *pitchfordi* but the IXth sternite is quite different and more nearly like that of *mulleri* from which it differs principally in having the dorsal margin nearly straight and the ventral apical angle evenly rounded and without the slight prominence. A single genal spine is always present.

Type ♂ off *Myotomys unisulcatus*, Moordkuil, Worcester, Cape Province. Thirty-three ♂♂ and thirty-three ♀♀ off the same host and locality. August 1944 (C. V. Muller).